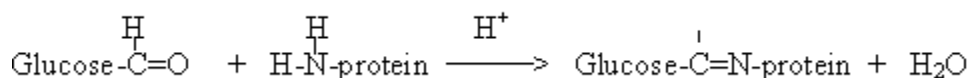


5.10 Glycated proteins

Glucose in the body (particularly the bloodstream) can react slowly and non-enzymatically with amine groups of proteins to form imines. These imines can rearrange further by the Amadori rearrangement and undergo further complicated Maillard reactions as discussed in 5.9.

The resulting proteins are called **glycated proteins**. Sometimes the glycated protein is still fully functional and sometimes it is not. The amount of glycated protein present is typically proportional to the concentration of blood glucose. Poorly controlled diabetics who have frequent high levels of blood glucose also have higher than normal levels of glycated proteins. These glycated proteins appear to be responsible for some of the health problems frequently experienced by diabetics.



(Some sources refer to these products as glycosylated proteins, but the official recommendation is that that term be reserved for specific enzymatic addition of a sugar to a protein and that the term glycated protein refer to the non-enzymatic, non-specific addition of sugars to proteins.)

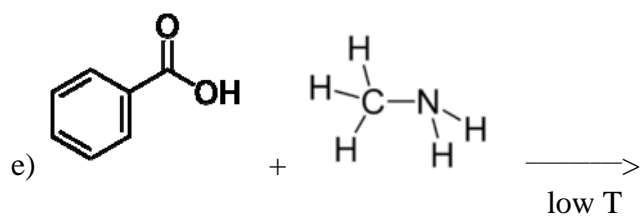
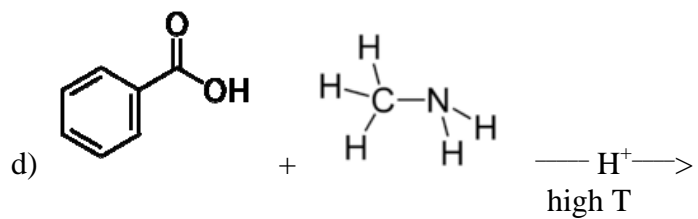
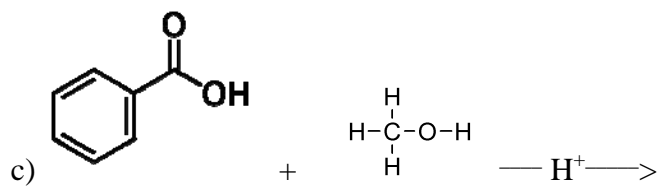
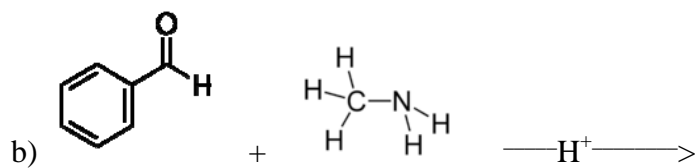
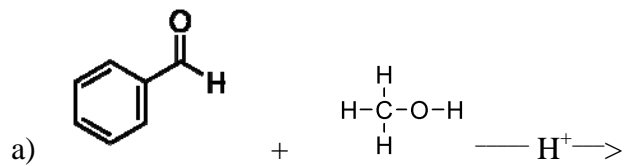
(Imine formation can occur in mitochondrial metabolism and may contribute to aging.)

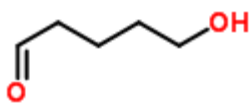
5.10 Review

When we do these reaction pathways, you need to ask yourself what are the reactant molecules and what products are we trying to form.

Reactants	Products
Carboxylic acid + alcohol	
Ester + water	
Aldehyde(ketone) + water	
Aldehyde(ketone) + alcohol	
Aldehyde(ketone) + amine	

Try doing the following reaction pathways. Note that different reactions are mixed altogether, so think about what functional groups you're starting with and what you should end up with!





g)

